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EUROPEAN PATENT APPLICATION

(21) Application number : **92309822.2**

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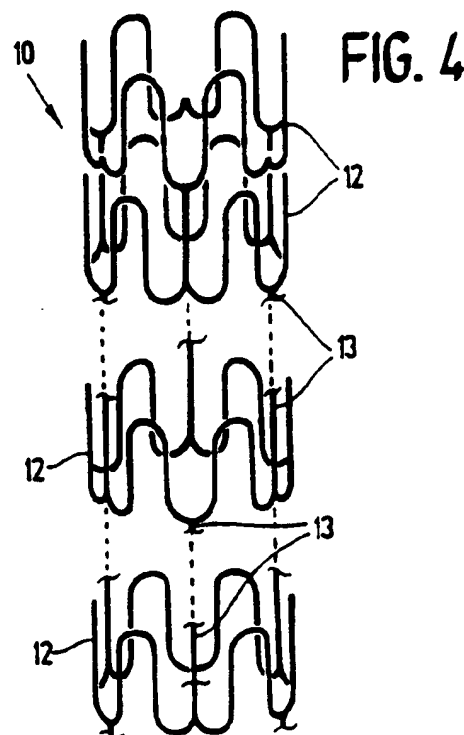
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(54) **Expandable stents and method for making same.**

(57) The invention is directed to an expandable stent (10) for implantation in a body lumen, such as an artery, and a method for making it from a single length of tubing. The stent (10) consists of a plurality of radially expandable cylindrical elements (12) generally aligned on a common axis and interconnected by one or more interconnective elements (13). The individual radially expandable cylindrical elements (12) consist of ribbon-like material disposed in an undulating pattern. The stents (10) are made by coating a length of tubing (21) with an etchant-resistive material and then selectively removing portions of the coating to form a pattern for the stent (10) on the tubing (21) to expose the portions of the tubing to be removed. This may be done by machine-controlled activation and relative positioning of a laser (24) in conjunction with the coated tubing (21). After the patterning of the tubing (21), the stent (10) is formed by removing exposed portions of the tubing (21) by an etching process.





European Patent
Office

PARTIAL EUROPEAN SEARCH REPORT

Application Number

which under Rule 45 of the European Patent Convention
shall be considered, for the purposes of subsequent
proceedings, as the European search report

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 5)
X	US-A-4 994 071 (D.C. MACGREGOR) * the whole document * ---	1-6, 10, 12-14, 20, 27	A61F2/06 C23F1/02
X	EP-A-0 364 787 (EXPANDABLE GRAFTS PARTNERSHIP) * abstract; figures 3, 4, 7, 8 * * column 7, line 11 - line 27 * * column 12, line 23 - line 29 * * column 13, line 14 - column 14, line 9 * ---	1, 2, 10, 20, 27 5, 7, 11	
A			
D, X	US-A-4 856 516 (CORDIS CORPORATION) * abstract; figures * ---	1-8, 10, 12-14, 27	
A	EP-A-0 423 916 (COOK) * figure 6 * ----- -/--	1, 2, 4, 5, 9, 10, 12, 14	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 5)
			A61F C23F
INCOMPLETE SEARCH			
<p>The Search Division considers that the present European patent application does not comply with the provisions of the European Patent Convention to such an extent that it is not possible to carry out a meaningful search into the state of the art on the basis of some of the claims</p> <p>Claims searched completely: Claims searched incompletely: Claims not searched: Reason for the limitation of the search:</p> <p>see sheet C</p>			
Place of search THE HAGUE		Date of completion of the search 16 AUGUST 1993	Examiner WOLF C.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : technological background O : non-written disclosure P : intermediate document A : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category			
A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503/83 (P04/87)



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid.
- namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions.

namely:

1. Claims 1-14 : A flexible stent made of cylindrical elements and a kit comprising the stent
2. Claims 15-27 : A process for making a stent or any other tubular structure including the step of applying a coating resistive to chemical etching

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid.
- namely claims:
- ☐ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.
- namely claims:



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 5)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
P,X	US-A-5 135 536 (R.A. HILLSTEAD) * the whole document * ---	1-4,6, 10,12,27	
P,A	WO-A-9 209 246 (NUMED) * abstract; figures * ---	1-5,12	
D,Y	US-A-4 733 665 (J.C. PALMAZ) * column 7, line 14 - line 20; figures 2A,2B * ---	15-18, 21-24,26	
Y	EP-A-0 338 816 (KAWASAKI STEEL CORPORATION) * abstract; figures 3,17 * * column 7, line 44 - line 48 * ---	15-18, 21-24,26	
Y	EP-A-0 361 192 (SIEMENS) * column 4, line 23 - line 38 * ---	18	TECHNICAL FIELD(S) SEARCHED (Int. Cl. 5)
A	EP-A-0 062 300 (FRUZ WITTIG) * page 4, line 1 - line 29 * ---	15,21-23	
A	US-A-4 767 418 (W. D. DEININGER) * column 3, line 48 - column 4, line 10 * ---	15,17, 21,22,26	
A	WO-A-9 107 139 (I. LEONARD) * page 3, line 8 - page 4, line 3 * * page 4, line 16 - line 22 * ---	21-23	
D,A	US-A-4 762 128 (R.F. ROSENBLUTH) * column 10, line 36 - line 47; figure 4 * ---	15-17, 21,22	
A	EP-A-0 407 951 (SHIPLEY COMPANY) * abstract * -----	18	



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-C-

INCOMPLETE SEARCH

Claims searched completely: 1-18,20-27

Claim not searched: 19

Method for treatment of the human or
animal body by surgery or therapy
(see article 52(4) of the European
Patent Convention)